

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA19 | Coleshill Junction

Data appendix (LQ-001-019)

Land quality

November 2013

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Department
for Transport

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1 Introduction

1.1.1 The land quality appendices for the Coleshill Junction community forum area (CFA) comprise:

- a summary of engagement undertaken (Section 2);
- detailed risk assessment (Section 3)
- inspection notes and other site data (Section 4);
- geological sites of scientific interest (SSSI) and local geological sites (LGS) (Section 5);
- mining and minerals data (Section 6)

1.1.2 Maps referred to throughout the land quality appendix are contained in the Volume 5 land quality map book.

2 Engagement

- 2.1.1 Table 1 sets out the local authorities and other organisations that have been engaged with during the preparation of the land quality section of the environmental impact assessment (EIA) for the Coleshill Junction study area, the types of information that have been provided to the assessment team and any specific concerns of those engaged with.

Table 1: Engagement on land quality issues undertaken for Coleshill Junction

Local authority or other organisation	Information provided and/or specific concerns
North Warwickshire Borough Council (NWBC)	Consulted for information on land contamination (via email 26 March 2013). The Council provided additional information on potentially contaminated areas identified by the desk study process and provided information on further areas which had not been picked up in the desk study. Information was also provided on areas of land which have been remediated although no details of the remediation undertaken were able to be provided.
Solihull Metropolitan Borough Council (SMBC)	Consulted Spatial planning department regarding mineral designations and mineral planning via email during 2012 and 2013. Meeting held on 27th March. Digital data partially provided in July 2013.
Solihull Metropolitan Borough Council (SMBC)	Consulted Environmental Health Department during 2012 and 2013. Meeting held 19th March 2013. SMBC provided GIS layer of potentially contaminated sites in June 2013 and further information in July 2013.
Warwickshire County Council (WCC)	Meeting held on 13 March 2013. Information on mineral sites (i.e. Mineral Safeguarding Areas within the study area of the Proposed Scheme) received as paper copies in November 2012 and digitally on 12 April 2013.
Environment Agency	Consulted for information on landfill sites within the study area (May 2013). Information received via email July 2013.

3 Detailed risk assessment

3.1.1 This appendix presents assessments for the areas assessed as potentially posing a contaminative risk for the Proposed Scheme. For each site the following data is presented:

- Baseline risk assessment;
- Construction risk assessment;
- post-Construction risk assessment; and
- assessment of temporary (construction) and permanent (post-construction) effects.

3.1.2 The sites assessed in this study area are set out in Table 2.

Table 2: Detailed risk assessment for areas assessed as potentially posing a contaminative risk for the Proposed Scheme

Site reference	Name	Table nos.
19-05	Woodlands Cemetery historical landfill	3-6
19-07	Former sewage works	7-10
19-08	Infilled pond	11-14
19-10 and 19-13	Grimstock Hill historical landfill and Trajan Hill historical landfill	15-18
19-12	Former garage	19-22
19-15	Infilled pond	23-26
19-16	Infilled pond	27-30
19-17	Coleshill Gas Works historical landfill	31-34
19-20	Timber yard, formerly a saw mill	35-38
19-18	Vehicle depot	39-42
19-24	Birmingham to Nuneaton Line	43-46
19-25	Coleshill Sewage Treatment Works	47-50
19-26	Coleshill Water Reclamation Works historical landfill	51-54
19-27	Former Coleshill Hall Hospital with former tank	55-58
19-35	Electricity substation	59-62
19-38	Infilled pond	63-66
19-40	Infilled pond	67-70
19-43	Infilled pond	71-74
19-45	Infilled pond	75-78
19-46	Infilled pond	79-82
19-49	Former works including coal and cement block factories now Jack O'Watton Business park	83-86
19-52	Infilled pit	87-90

Site reference	Name	Table nos.
19-56	Infilled pond	91-94

- 3.1.3 Contaminant types included within the risk assessments are based on the Priority Contaminants Report CLR 8¹. Although this report has been withdrawn by the Environment Agency, there has been no subsequent authoritative document to replace it.
- 3.1.4 The remainder of this section of the appendix presents the conceptual site models (CSM) and risk assessment for the sites set out in Table 2.

¹ DEFRA and Environment Agency (2002) CLR 8: Potential Contaminants for the Assessment of Land Contamination.

Table 3: 19-05 Woodlands Cemetery historical landfill baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Woodlands Cemetery historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas, depending on the waste types and composition accepted.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - pond, drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

Woodlands Cemetery historical landfill is situated 100m from the western area of land required to construction the Proposed Scheme, approximately 450m from the Proposed Scheme which will be on embankment and cutting. The dates of operation of the former landfill are unknown, as well as the types of waste accepted. A range of organic and inorganic contaminants, leachate and ground (landfill) gas are expected to be associated with the historical landfill. There are residential property receptors within 180m of the former landfill and the nearest surface water receptors within 250m include a pond and drains, located on the historical landfill and a tributary of the River Cole, situated approximately 30m from the historical landfill. Superficial deposits underlying the historical landfill are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 4: 19-05 Woodlands Cemetery historical landfill construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Woodlands Cemetery historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas, depending on the waste types and composition accepted.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - pond, drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the historical landfill should not be disturbed during construction because it is outside of the area required for construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the Code of Construction Practice (CoCP).

Note

Construction workers have not been included in this assessment.

Table 5: 19-05 Woodlands Cemetery historical landfill Post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Woodlands Cemetery historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas, depending on the waste types and composition accepted.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - pond, drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered in the area of land required for construction will be removed so there should be no residual contamination within the area required for construction, but Woodlands Cemetery historical landfill will remain post-construction so the risks will remain the same as at baseline.

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Table 6: 19-05 Woodlands Cemetery historical landfill significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 7: 19-07 Former sewage works baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Former sewage works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas/volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Low risk				

Description

A former sewage works is situated along the route of the Proposed Scheme which will be constructed on viaduct in this area. The M42 motorway has been constructed over part of the former sewage works, but the other portion remains undeveloped. There are residential property receptors within 110m of the former sewage works and the nearest surface waters within 250m are drains and the River Cole. Superficial deposits underlying the site are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 8: 19-07 Former sewage works construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Former sewage works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas/volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/low
	Controlled waters - drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Moderate/low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the former sewage works will be disturbed during construction of the Proposed Scheme on viaduct. Any contaminated material encountered will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 9: 19-07 Former sewage works post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Former sewage works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas/volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Unlikely	Minor	Very low
	Controlled waters - drains, River Cole	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction.

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Table 10: 19-07 Former sewage works significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Moderate/Low	Very low	Minor adverse	Minor beneficial
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Moderate/low	Low		
Overall significance				Negligible to minor adverse	Negligible to minor beneficial

Table 11: 19-o8 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifer	Unlikely	Minor	Very low
	Controlled waters - ponds, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pond is situated within the eastern area of land required for construction where the Proposed Scheme will be constructed on embankment. The land use for this area will be planting. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a range of contaminants including leachate and ground-(landfill) gas are associated with the infilled ground. There are residential property receptors within 80m of the infilled pond. The nearest surface waters within 250m are ponds and unnamed surface watercourses. There are no superficial deposits underlying the infilled pond and bedrock is classified as a Secondary B aquifer.

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Table 12: 19-o8 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifer	Unlikely	Minor	Very low
	Controlled waters - ponds, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- there is likely to be minimal disturbance to the infilled pond during construction of the embankment, but should contaminated water/material be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 13: 19-o8 Infilled pond Post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifer	Unlikely	Minor	Very low
	Controlled waters - ponds, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that the pond will remain given the limited disturbance of the area, but should any contaminated material be encountered this will be removed during construction.
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Table 14: 19-o8 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Very low	Very low	Very low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 15: 19-10, 19-13 Grimstock Hill and Trajan Hill historical landfills baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Grimstock and Trajan historical landfills Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

Description

Two historical landfills, Grimstock Hill and Trajan Hill, are located approximately 195m and 165m east, respectively, of the area required for construction, approximately 400m from the Proposed Scheme which will be constructed in cutting and on embankment in this area. Grimstock Hill landfill was licensed between 1981 and 1993 to accept excavated soil and topsoil. The Environment Agency (EA) and North Warwickshire District Council (NWDC) hold no details to confirm if the historical landfill was ever filled. No records are held by the EA or NWDC on Trajan Hill historical landfill. The nearest land use will be planting in this area. There are numerous residential property receptors within 250m of the historical landfills. The nearest surface water within 250m is an unnamed stream. Superficial deposits underlying the site are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 16: 19-10, 19-13 Grimstock Hill and Trajan Hill historical landfills construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Grimstock and Trajan historical landfills Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the historical landfills should not be disturbed during construction because they are outside of the area required for construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 17: 19-10, 19-13 Grimstock Hill and Trajan Hill historical landfills post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Grimstock and Trajan historical landfills Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the historical landfills are likely to remain.

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Table 18: 19-10, 19-13 Grimstock Hill and Trajan Hill historical landfills significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Main risk	Moderate/low	Moderate/low	Moderate/low		
Overall significance				Negligible	Negligible

Table 19: 19-12 Former garage baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Former garage Existing contaminants in the soils and groundwater at the source, potentially including but not limited to fuels, oils and other organic and inorganic contaminants.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

A former garage is located approximately 30m east of the area required for construction, approximately 300m from the Proposed Scheme which will be constructed in cutting in this area. A realistic and worst case scenario is that there have been oil/fuel leaks at the garage and that contamination is present in the soil and groundwater. The nearest land use in this area will be an access road. There are numerous residential property receptors within 250m of the former garage. There are no surface waters within 250m of the former garage. Superficial deposits underlying the former garage are classified as unproductive and bedrock as a Secondary B aquifer.

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Table 20: 19-12 Former garage construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Former garage Existing contaminants in the soils and groundwater at the source, potentially including but not limited to fuels, oils and other organic and inorganic contaminants.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the former garage should not be disturbed during construction because it is outside of the area required for construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 21: 19-12 Former garage post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Former garage Existing contaminants in the soils and groundwater at the source, potentially including but not limited to fuels, oils and other organic and inorganic contaminants.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Unproductive superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the former garage is likely to remain.

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Table 22: 19-12 Former garage significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary B aquifer	Low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 23: 19-15 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Unproductive superficial deposits and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in unproductive superficial deposits and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

Description

An Infilled pond is situated partially within the western area required for construction, approximately 55m from where the Proposed Scheme will be constructed in cutting. The nearest land use will be planting and footpath construction. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors at the site of the infilled pond, and within 250m. The nearest surface waters within 250m are ponds. Superficial deposits underlying the infilled pond are classified as unproductive strata and Bedrock as a Secondary B aquifer.

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Table 24: 19-15 Infilled pond Construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Unproductive superficial deposits and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in unproductive superficial deposits and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the infilled pond is likely to be only minimally disturbed during construction, should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 25: 19-15 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Unproductive superficial deposits and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in unproductive superficial deposits and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

Note

It is assumed that the pond will remain given the limited disturbance of the area, but should any contaminated material be encountered, this will be removed during construction.

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Table 26: 19-15 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 27: 19-16 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

Description

An infilled pond is situated within and up to 20m from the eastern area required for construction, approximately 10m from where the Proposed Scheme will be constructed on embankment and viaduct. The nearest land use will be planting and viaduct construction. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors at the site of the infilled pond and within 250m. The nearest surface waters within 250m are ponds. Superficial deposits underlying the infilled pond are classified as Secondary A aquifer and Bedrock as a Secondary B aquifer.

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Table 28: 19-16 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Likely	Minor	Moderate/low
		Direct run-off from site	Likely	Minor	Moderate/low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the infilled pond is likely to be disturbed during construction, and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 29: 19-16 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Minor	Low
Main risk	Low risk				

Note

It is assumed that some of the pond may remain given the limited disturbance of the area, but should any contaminated material be encountered, this will be removed during construction.

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Table 30: 19-16 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Moderate/low	Low	Minor adverse	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Low	Moderate/low	Low	Minor adverse	Negligible
Discharge of contaminants to surface water by direct run-off from site	Low	Moderate/low	Low	Minor adverse	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible to minor adverse	Negligible

Table 31: 19-17 Coleshill Gas Works historical landfill baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Coleshill Gas Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

Description

Coleshill Gas Works historical landfill is located along the route of the Proposed Scheme and extends up to 300m from the area required for construction. The Proposed Scheme will be constructed on embankment and viaduct in this area. The main land uses in the area will be viaduct construction and planting. A full range of organic and inorganic contaminants, leachate and ground-(landfill) gas are associated with the historical landfill and the landfill is known to have accepted industrial waste. There are residential property and commercial property receptors adjacent to the historical landfill. The nearest surface waters within 250m are drains and the River Tame. Superficial deposits underlying the historical landfill are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 32: 19-17 Coleshill Gas Works historical landfill construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Coleshill Gas Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- part of the historical landfill is likely to be disturbed during construction and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 33: 19-17 Coleshill Gas Works historical landfill post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Coleshill Gas Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground- (landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the historical landfill is likely to remain.

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Table 34: 19-17 Coleshill Gas Works historical landfill significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by inhalation of migrating ground-gas/volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Moderate/Low	Low	Minor adverse	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Low	Very low	Minor adverse	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Low	Very low	Minor adverse	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible to minor adverse	Negligible

Table 35: 19-18 Vehicle depot baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Current depot (former road haulage) Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oils, fuels, solvents.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

A vehicle depot, formerly road haulage, is situated partially within the eastern area required for construction, approximately 190m from where the Proposed Scheme will be constructed on embankment and viaduct. The main land use in this area will be planting. A realistic and worst case scenario has been assumed that tanks used to store fuels and oils are present at the depot and will have also been present when it was a road haulage. Furthermore, it is assumed that a number of vehicles will have been stored at and currently use the depot and that fuel/oil may have leaked from them. Residential property receptors are located within 170m at Brickhill Street Farm, and commercial property receptors are adjacent to the depot. The nearest surface water within 250m is a drain. Superficial deposits underlying the depot are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 36: 19-18 Depot construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Current depot (former road haulage) Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oils, fuels, solvents.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the depot is unlikely to be disturbed during construction but should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 37: 19-18 Vehicle depot post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Current depot (former road haulage) Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oils, fuels, solvents.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the depot is likely to remain.

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Table 38: 19-18 Vehicle depot significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 39: 19-20 Timber yard baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Former saw mill, current timber yard Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphates, asbestos, phenols, acetone, oil/fuel hydrocarbons, aliphatic and aromatic hydrocarbons, pesticides, organotin compounds	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - River Cole, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

A former saw mill, now a timber yard, is located along the route of the Proposed Scheme which will be constructed on viaduct in this location. The timber yard will be demolished during construction. There are commercial property and residential property receptors within 250m of the timber yard. The River Cole runs adjacent to the timber yard, and there are two unnamed surface watercourses within 250m of the timber yard. Superficial deposits underlying the timber yard are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 40: 19-20 Timber yard construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Former saw mill, current timber yard Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphates, asbestos, phenols, acetone, oil/fuel hydrocarbons, aliphatic and aromatic hydrocarbons, pesticides, organotin compounds	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/Low
	Controlled waters - River Cole, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Moderate/Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the timber yard will be demolished during construction and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 41: 19-20 Timber yard post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Former saw mill, current timber yard Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphates, asbestos, phenols, acetone, oil/fuel hydrocarbons, aliphatic and aromatic hydrocarbons, pesticides, organotin compounds	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Unlikely	Minor	Very low
	Controlled waters - River Cole, unnamed surface watercourses	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
Main risk	Very Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction. The timber yard will not remain post-construction.

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Table 42: 19-20 Timber yard significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Very low	Very low	Minor beneficial	Minor beneficial
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Very low	Very low	Minor beneficial	Minor beneficial
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Very low	Negligible	Minor beneficial
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Very low	Negligible	Minor beneficial
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Moderate/Low	Very low	Minor adverse	Minor beneficial
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Low	Low	Very low	Negligible	Minor beneficial
Discharge of contaminants to surface water by direct run-off from site	Low	Low	Very low	Negligible	Minor beneficial
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Very low		
Overall significance				Minor adverse to Negligible	Negligible to minor beneficial

Table 43: 19-24 Birmingham to Nuneaton Railway Line baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Derby to Birmingham Railway Line Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oil/fuel hydrocarbons, aromatic hydrocarbons, metals, fuels, oils, asbestos and sulphates	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

The Proposed Scheme intersects the existing Birmingham to Nuneaton Railway Line on embankment, approximately 200m east of Jack O'Watton. There are numerous commercial property and residential property receptors within 250m of the point at which the railway is intersected. There is an unnamed surface watercourse within 250m. Superficial deposits underlying the railway line are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 44: 19-24 Birmingham to Nuneaton Railway Line construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Derby to Birmingham Railway Line Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oil/fuel hydrocarbons, aromatic hydrocarbons, metals, fuels, oils, asbestos and sulphates	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the railway line itself will not be disturbed during construction, but the land adjacent to it will be disturbed during construction of the proposed viaduct, into which slight contamination may have migrated. Should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 45: 19-24 Birmingham to Nuneaton Railway Line post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Derby to Birmingham Railway Line Existing contaminants in the soils and groundwater at the site, potentially including but not limited to oil/fuel hydrocarbons, aromatic hydrocarbons, metals, fuels, oils, asbestos and sulphates	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the railway line will still remain post-construction.

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Table 46: 19-24 Birmingham to Nuneaton Railway Line significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 47: 19-25 Coleshill Sewage Treatment Works baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Sewage works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site users of commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Low risk				

Description

Coleshill Sewage Treatment Works is located over the boundary between Coleshill Junction CFA and Curdworth to Middleton CFA. Within Coleshill CFA the Proposed Scheme will cross the western tip of the sewage, where the Proposed Scheme is constructed on both embankment and viaduct in this area. There are commercial property and residential property receptors within 250m of the sewage works. The nearest surface waters within 250m include the River Tame and various drains and ponds mainly associated with the sewage works. Superficial deposits underlying the sewage works are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 48: 19-25 Coleshill Sewage Treatment Works construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Sewage works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site users of commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Moderate/Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- a number of buildings associated with the sewage works are to be demolished during construction and any contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the Code of Construction Practice.

Note

Construction workers have not been included in this assessment.

Table 49: 19-25 Coleshill Sewage Treatment Works post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Sewage Works Existing contaminants in the soils and groundwater at the site, potentially including but not limited to ground gas, metals (cadmium, chromium, copper, lead, mercury, nickel, zinc and arsenic), free cyanide, nitrate, sulphate, sulphur, oil/fuel hydrocarbons, chlorinated hydrocarbons, PCBs and asbestos.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site users of commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the sewage works will remain.
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Table 50: 19-25 Coleshill Sewage Treatment Works significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Moderate/Low	Low	Minor adverse	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Low	Low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Moderate/low	Low		
Overall significance				Minor adverse to Negligible	Negligible

Table 51: 19-26 Coleshill Water Reclamation Works historical landfill baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Coleshill Water Reclamation Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

Description

Coleshill Water Reclamation Works historical landfill is located over the boundary between Coleshill Junction CFA and Curdworth to Middleton CFA 40m east of the area required for construction, approximately 85m from the Proposed Scheme which will be constructed on embankment and viaduct in this area. A range of organic and inorganic contaminants, leachate and ground-(landfill) gas are associated with the historical landfill. The nearest land use will be planting and viaduct construction in this area. There are no residential property receptors within 250m of the historical landfill. The River Tame is adjacent to the historical landfill and there are several unnamed ponds and streams within 250m. Superficial deposits underlying the historic landfill are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 52: 19-26 Coleshill Water Reclamation Works historical landfill construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Coleshill Water Reclamation Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the historical landfill should not be disturbed during construction because it is outside of the area required for construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 53: 19-26 Coleshill Water Reclamation Works historical landfill post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Coleshill Water Reclamation Works historical landfill Existing contaminants in the soils and groundwater at the site, potentially including but not limited to a range of organic and inorganic, leachate and ground-(landfill) gas, depending on waste types and composition.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Moderate	Moderate/low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - unnamed surface watercourse	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Low likelihood	Moderate	Moderate/low
Main risk	Moderate/low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the historical landfill is likely to remain.

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Table 54: 19-26 Coleshill Water Reclamation Works historical landfill significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Main risk	Moderate/low	Moderate/low	Moderate/low		
Overall significance				Negligible	Negligible

Table 55: 19-27 Former Coleshill Hall Hospital with former tank baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Former Coleshill Hall Hospital with former tank Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a fuel/oils	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Negligible	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Negligible	Very low
		Inhalation of volatile vapours from contaminated soil/water.	Unlikely	Negligible	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A superficial aquifer and Secondary B Aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

A former tank was located at Coleshill Hall Hospital, now Coleshill Manor Office Campus, which is understood to be in commercial use. The former tank is situated within the area required for construction, approximately 30m from where the Proposed Scheme will be constructed on embankment. The main land use in this area will be rail engineering and construction. A realistic and worst case scenario is assumed that the tank was used to store fuels or oils and has leaked. There are residential properties 180m from the former tank and former hospital and commercial properties adjacent to it. Superficial deposits underlying the former tank are classified as a Secondary A aquifer and bedrock is classified as a Secondary B aquifer. There are no surface waters within 250m.

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Table 56: 19-27 Former Coleshill Hall Hospital with former tank construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Former Coleshill Hall Hospital with former tank Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a fuel/oils	Current site users ²	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Negligible	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Negligible	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Negligible	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A superficial aquifer and Secondary B Aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- site of the former hospital and former tank are likely to be only minimally disturbed during construction, therefore risks remain the same as at baseline. However the current building adjacent to the former tank will be demolished and has been removed as a potential receptor;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment. It is considered that there may be a slightly increased risk of mobilisation and leaching of existing contamination to groundwater during construction.

² Building demolished during construction.

Table 57: 19-27 Former Coleshill Hall Hospital with former tank post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Former Coleshill Hall Hospital with former tank Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a fuel/oils	Current site users ³	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Negligible	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Negligible	Very low
		Inhalation of volatile vapours from contaminated soil/water.	Unlikely	Negligible	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A superficial aquifer and Secondary B Aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

The site of the former tank will remain post-construction; therefore, post-construction risks are similar to those at baseline.

³ Building demolished during construction.

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Table 58: 19-27 Former Coleshill Hall Hospital with former tank significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary B aquifer	Low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 59: 19-35 Electricity substation baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Electricity substation Existing contaminants in the soils and groundwater at the site, potentially including but not limited to fuels, oils, PCBs and metals.	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial and Secondary B bedrock aquifers	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

An electricity substation is located adjacent to the eastern area required for construction, approximately 85m from where the Proposed Scheme will be constructed on embankment. The main land use of the electricity substation will be planting. Residential property receptors are located within 40m and surface watercourses within 250m include drains. Superficial deposits are classified as a Secondary A aquifer and bedrock is classified as a Secondary B Aquifer.

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Table 60: 19-35 Electricity substation construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Electricity substation Existing contaminants in the soils and groundwater at the site, potentially including but not limited to fuels, oils, PCBs and metals	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial and Secondary B bedrock aquifers	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the electricity substation should not be disturbed during construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 61: 19-35 Electricity substation post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Electricity substation Existing contaminants in the soils and groundwater at the site, potentially including but not limited to fuels, oils, PCBs and metals	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial and Secondary B bedrock aquifers	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the electricity substation is likely to remain.

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Table 62: 19-35 Electricity substation significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 63: 19-38 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial aquifer and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An Infilled pond is situated adjacent to the northern area required for construction, approximately 200m from where the Proposed Scheme will be constructed in cutting. The land nearest this area will mainly be used as a landscape compensation area. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. The infilled pond is located within 35m of residential property receptors. There are no surface waters within 250m of the infilled pond. Superficial deposits underlying the infilled pond are classified as a Secondary A aquifer and bedrock is classified as a Secondary B aquifer.

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Table 64: 19-38 Infilled pond Construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial aquifer and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the infilled pond should not be disturbed during construction because it is outside of the area required for construction, migration may have occurred and should contaminated material/water be encountered it will remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the Code of Construction Practice.

Note

Construction workers have not been included in this assessment.

Table 65: 19-38 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial aquifer and Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the infilled pond (located outside the area required for construction) is likely to remain.

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Table 66: 19-38 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 67: 19-40 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifer	Low likelihood	Minor	Low
	Controlled waters - pond	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pond is situated approximately 415m north of where the Proposed Scheme will be constructed on embankment. This area will be exchanged with the nearby school to provide compensation for the loss of playing fields. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors and a school within 250m of the infilled pond. The nearest surface waters within 250m is a pond, approximately 60m south-east of the infilled pond. There are no superficial deposits recorded at the site and bedrock is classified as a Secondary B aquifer.

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Table 68: 19-40 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifers	Likely	Minor	Moderate/low
	Controlled waters - pond	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- given that the area of land is being exchanged with the school to re-provide playing fields, a ground investigation will be required followed by a risk assessment. The results of the risk assessment will detail any remediation requirements which are likely to involve the installation of a capping layer or removal/remediation of any contaminated material/water. This risk assessment has assumed that the material will be removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 69: 19-40 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	On-site users (school children)	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary B bedrock aquifer	Unlikely	Minor	Very low
	Controlled waters - pond	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

The area of land will be exchanged with the nearby school to re-provide playing fields. It has been assumed that the infilled pond will not be present post-construction. However, should it be decided to place a capping layer may over the pond, the risks would be the same as those at baseline with the addition of an on-site receptor.

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Table 70: 19-40 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors (school children) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	n/a	n/a	Very low	n/a	Negligible
Exposure of on-site human receptors (school children) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	n/a	n/a	Very low	n/a	Negligible
Exposure of on-site human receptors (school children) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	n/a	n/a	Low	n/a	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary B aquifer	Low	Moderate/low	Very low	Minor adverse	Minor beneficial
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Very low	Negligible	Minor beneficial
Main risk	Low	Low	Very low		
Overall significance				Negligible - minor adverse	Negligible - Minor beneficial

Table 71: 19-43 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pond is situated within the area required for construction, approximately 215m north of where the Proposed Scheme will be constructed in cutting. This area will be used for ecological mitigation. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors adjacent to the infilled pond. The nearest surface waters within 250m are numerous ponds. Superficial deposits underlying the infilled pond are classified as a Secondary A Aquifer and bedrock as a Secondary B aquifer.

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Table 72: 19-43 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds and drains	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the infilled pond is likely to undergo only limited disturbance during construction, should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 73: 19-43 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds and drains	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the infilled pond is likely to remain post-construction.

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Table 74: 19-43 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 75: 19-45 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Minor	Low
Main risk	Low risk				

Description

An infilled pond is situated within the area required for construction, approximately 175m north of where the Proposed Scheme will be constructed on embankment. This area will be used for ecological mitigation. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors within 150m of the infilled pond. The nearest surface waters within 250m are numerous ponds and drains. Superficial deposits underlying the infilled pond are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 76: 19-45 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds and drains	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Minor	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the infilled pond is likely to undergo only limited disturbance during construction, should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 77: 19-45 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds and drains	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Minor	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the infilled pond is likely to remain post-construction.

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Table 78: 19-45 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B Aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 79: 19-46 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - ponds	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pond is situated along the route of the Proposed Scheme, which will be constructed on viaduct in this location. This area will be used for viaduct construction. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are residential property receptors within 30m of the infilled pond. The nearest surface water within 250m is a drain. Superficial deposits underlying the infilled pond are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 8o: 19-46 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/low
	Controlled waters - drain	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Moderate/low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the infilled pond is likely to undergo significant disturbance during construction, should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 81: 19-46 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Moderate	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Unlikely	Minor	Very low
	Controlled waters - ponds and drains	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction and the infilled pond is unlikely to remain post-construction.

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Table 82: 19-46 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Moderate/low	Very low	Negligible to minor adverse	Negligible to minor beneficial
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Low	Very low	Negligible to minor adverse	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible to minor adverse	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible to minor adverse	Negligible
Migration and accumulation of ground-gas into property	Low	Moderate/low	Low	Negligible to minor adverse	Negligible
Main risk	Low	Moderate/low	Low		
Overall significance				Negligible to minor adverse	Negligible to minor beneficial

Table 83: 19-49 Former works now Jack O'Watton Business Park baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Former works including coal and cement block factory now Jack O'Watton Business Park Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphide, asbestos, acetone, phenols, aromatic hydrocarbons, oil/fuel hydrocarbons	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Description

A former works including coal and cement block factory, now Jack O'Watton Business Park, is located partially within and up to 250m from the area required for construction, approximately 165m from where the Proposed Scheme is constructed on viaduct and embankment. The nearest land use is planting, access road construction and a balancing pond. There are users of the current business park and both commercial property and residential property receptors within 250m of the former works. There are a number of unnamed surface watercourses within 250 of the former works. Superficial deposits underlying the former works are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 84: 19-49 Former works now Jack O'Watton Business Park construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Former works including coal and cement block factory now Jack O'Watton Business Park Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphide, asbestos, acetone, phenols, aromatic hydrocarbons, oil/fuel hydrocarbons	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- although the former works should not be disturbed during construction because it is only partially in and adjacent to the area required for construction, migration may have occurred and should contaminated material/water be encountered it will be remediated or removed.
- it is unlikely that remediation over and above the removal of contaminated material will be required.
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 85: 19-49 Former works now Jack O'Watton Business Park post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Former works including coal and cement block factory now Jack O'Watton Business Park Existing contaminants in the soils and groundwater at the site, potentially including but not limited to metals, sulphide, asbestos, acetone, phenols, aromatic hydrocarbons, oil/fuel hydrocarbons	Current site users	Direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in contaminated waters	Unlikely	Minor	Very low
		Inhalation of volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Users of off-site commercial properties	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Low likelihood	Minor	Low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating volatile vapours from contaminated soil/water	Low likelihood	Minor	Low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction, but the former works (located outside the area required for construction) is likely to remain.

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Table 86: 19-49 Former works now Jack O'Watton Business Park significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil and soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of on-site human receptors by direct contact and ingestion of contaminated waters	Very low	Very low	Very low	Negligible	Negligible
Exposure of on-site humans to contamination by inhalation of volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (commercial) to contamination by inhalation of migrating volatile vapours from contaminated soil/water	Low	Low	Low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 87: 19-52 Infilled pit baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pit Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
		Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
	Controlled waters - drains, River Tame	Direct run-off from site	Unlikely	Minor	Very low
		Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
	Property - buildings, infrastructure, their foundations and services	Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pit is situated within the western area required for construction, approximately 130m from the Proposed Scheme, which will be constructed on viaduct and embankment in this area. The nearest land use in this area will be viaduct construction. A realistic and worst case scenario is assumed that the pit was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are no residential property receptors within 250m of the infilled pit. The nearest surface waters within 250m are drains and the River Tame. Superficial deposits underlying the infilled pit are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 88: 19-52 Infilled pit construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pit Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the infilled pit is unlikely to be disturbed during construction however should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 89: 19-52 Infilled pit post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pit Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A Superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction. The infilled pit is likely to remain post-construction.

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Table 90: 19-52 Infilled pit significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Low	Low	Negligible	Negligible
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Very low	Very low	Negligible	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Low	Negligible	Negligible
Main risk	Low	Low	Low		
Overall significance				Negligible	Negligible

Table 91: 19-56 Infilled pond baseline CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Low likelihood	Minor	Low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Low risk				

Description

An infilled pond is situated along the Proposed Scheme, which will be constructed on viaduct in this area. The land use in this area will be viaduct construction. A realistic and worst case scenario is assumed that the pond was manually infilled with waste and a full range of contaminants including leachate and ground (landfill) gas is associated with the infilled ground. There are commercial property (sewage works, and Jack O'Watton business park) and residential property receptors within 250m of the infilled pond. The nearest surface waters within 250m are drains and the River Tame. Superficial deposits underlying the infilled pond are classified as a Secondary A aquifer and bedrock as a Secondary B aquifer.

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Table 92: 19-56 Infilled pond construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Likely	Minor	Moderate/low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Low likelihood	Minor	Low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Low likelihood	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Low
Main risk	Moderate/low risk				

The above risk assessment assumes that the below mitigation measures will be applied during construction:

- the infilled pond will be removed during construction and should contaminated material/water be encountered it will be remediated or removed;
- it is unlikely that remediation over and above the removal of contaminated material will be required;
- during construction standard mitigation procedures will be in place in accordance with the CoCP.

Note

Construction workers have not been included in this assessment.

Table 93: 19-56 Infilled pond post-construction CSM and qualitative risk assessment

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction with mitigation
Infilled pond Existing contaminants in the soils and groundwater at the source, potentially including but not limited to a range of inorganic and organic contaminants, leachate and ground (landfill) gas.	Off-site residents	Direct contact, ingestion and inhalation of contaminants in windblown soil-derived dust	Unlikely	Minor	Very low
		Direct contact and ingestion of contaminants in migrating contaminated waters	Unlikely	Minor	Very low
		Inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Unlikely	Minor	Very low
	Controlled waters - Secondary A superficial aquifer and Secondary B bedrock aquifer	Leaching of contaminants from soil to groundwater and vertical and lateral migration in Secondary A superficial and Secondary B bedrock aquifers	Unlikely	Minor	Very low
	Controlled waters - drains, River Tame	Lateral migration of contaminants in groundwater and discharge as base flow	Unlikely	Minor	Very low
		Direct run-off from site	Unlikely	Minor	Very low
	Property - buildings, infrastructure, their foundations and services	Direct contact of property with contaminants in soil and surface water/groundwater	Unlikely	Negligible	Very low
		Migration and accumulation of ground-gas into property	Unlikely	Moderate	Very low
Main risk	Very Low risk				

Note

It is assumed that any contaminated material encountered will be removed during construction so there should be no residual contamination within the area required for construction. The infilled pond will have been removed during construction.

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Table 94: 19-56 Infilled pond significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of adjacent human receptors (residents) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by direct contact and ingestion of contaminants in migrating contaminated water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Leaching of contaminants from soil to groundwater and vertical and lateral migration in groundwater in Secondary A and B aquifers	Low	Moderate/Low	Very low	Minor adverse	Minor beneficial
Lateral migration of contaminants in groundwater and discharge to surface waters as base flow	Very low	Low	Very low	Minor adverse	Negligible
Discharge of contaminants to surface water by direct run-off from site	Very low	Very low	Very low	Negligible	Negligible
Direct contact of property with contaminants in soil and surface water/groundwater	Very low	Very low	Very low	Negligible	Negligible
Migration and accumulation of ground-gas into property	Low	Low	Very low	Negligible	Minor beneficial
Main risk	Low	Low	Low		
Overall significance				Minor adverse to Negligible	Negligible to minor beneficial

4 Inspection notes and other site data

4.1.1 This appendix presents the following data:

- site inspection notes for those key potentially contaminated sites visited during the study period;
- names of ground investigation or contamination survey reports reviewed during the study period; and
- any other relevant site data.

4.1.2 The remainder of this section of the appendix presents the inspection notes and other data for the sites.

Table 95: Site inspection notes

Walkover location	Details
Coleshill gas works historical landfill	
Date of walkover	01 July 2013
Location of area	NGR – 419031 291154
Access to area	Site viewed from public highway
Site description	The majority of the gas works historical landfill has been redeveloped as a trading estate. However the western side has not been redeveloped. The proposed Main Line will be on embankment through this area and the and North Chord will cross this area on viaduct.
Topography and surroundings – elevation in relation to surroundings, hummocks, breaks of slope etc.	Topography generally slopes towards the south east. Hummocky in some areas. A stream is culverted under the A446 and flows through the site.
Neighbouring site use (in particular note any potentially contaminative activities or sensitive receptors)	Trading estate immediately to the east. Water Orton railway line immediately to the north – beyond which lies four residential houses and Coleshill sewage works to the north east. The A446 forms the western boundary.
Site buildings – extent, size, type and usage. Boiler rooms, electrical switchgear	No buildings on site.
Ground surfacing – type and condition	The ground surface is vegetated.
Vegetation – evidence of distress, unusual growth or invasive species such as Japanese Knotweed	Site is covered with variable vegetation including grass, scrub and mature trees.
Services – evidence of buried services	None observed.

4.1.3 NWBC were able to confirm that the part of the gas works historical landfill that has been redeveloped was subject to a remediation scheme in the 1990s. However due to the destruction of the archived ground investigation and remediation reports these reports could not be reviewed and it is not known if the area of the site that the Proposed Scheme will cross has been remediated.

5 Geological SSSI and local geological sites

5.1.1 This appendix presents the following data:

- citation data for geological sites of special scientific interest (SSSI);
- citation data for local geological sites (LGS), formerly called regionally important geological sites (RIGS); and
- any other relevant site data.

5.1.2 There are no geological SSSI or local geological sites in the Coleshill Junction study area.

6 Mining and minerals data

6.1.1 This appendix presents the following data relating to mining and minerals information:

- details of planning data for minerals sites;
- lists of marl pits in each study area; and
- data from The Coal Authority.

6.1.2 There are no relevant mining sites or additional relevant mineral data for the Coleshill Junction study area.